



(11) **EP 2 416 392 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
01.05.2013 Bulletin 2013/18

(51) Int Cl.:
H01L 51/00 (2006.01) H01L 51/50 (2006.01)

(43) Date of publication A2:
08.02.2012 Bulletin 2012/06

(21) Application number: **11176592.1**

(22) Date of filing: **04.08.2011**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(72) Inventors:
• **Harada, Shigeyuki**
Ohta-ku, Tokyo 143-8555 (JP)
• **Sasaki, Masaomi**
Ohta-ku, Tokyo 143-8555 (JP)
• **Abe, Mikiko**
Ohta-ku, Tokyo 143-8555 (JP)

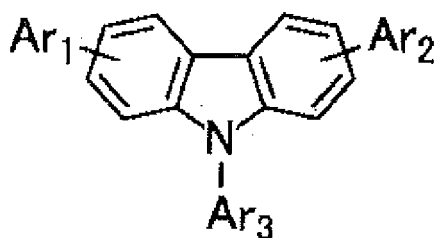
(30) Priority: **06.08.2010 JP 2010178148**
13.07.2011 JP 2011154838

(74) Representative: **Lamb, Martin John Carstairs**
Marks & Clerk LLP
90 Long Acre
London
WC2E 9RA (GB)

(71) Applicant: **Ricoh Company, Ltd.**
Tokyo 143-8555 (JP)

(54) **Light emitting device and display unit**

(57) A light emitting device having a substrate and a luminous layer provided overlying the substrate, which includes a semiconductor nanocrystal to which a carbazole derivative is coordination-bonded or attached, the carbazole derivative having aromatic rings of a compound represented by the chemical structure 1 having one to three substitution groups:



Chemical Structure 1

where Ar₁ and Ar₂ independently represent substituted or non-substituted aryl groups that may share a linkage to form a ring with a benzene ring, heterocyclic groups, and hydrogen atoms and Ar₃ represents a substituted or non-substituted aryl group, the one to three substitution groups represented by the chemical structure 2:



where X represents a methylene group, a carbonyloxy group, an oxycarbonyl group, a carbonyl group, an oxygen atom, and a sulfur atom, Y represents a substituted or non-substituted alkylene group, and Z represents a carboxyl group, a hydroxyl group, and a thiol group.



EUROPEAN SEARCH REPORT

Application Number
EP 11 17 6592

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	EP 2 184 333 A2 (SAMSUNG ELECTRONICS CO LTD [KR]) 12 May 2010 (2010-05-12) * paragraphs [0042], [0042], [0045], [0046], [0050], [0057], [0058]; figures 2a,2b *	1-6	INV. H01L51/00 H01L51/50
Y	----- WANG, S., LI, Y.L., DU, C.M., SHI, Z.Q., XIAO, S.X., FANG, H.J., ZHU, D.B.: "Self-Organization of Gold Nanoparticles Protected by 9-(5-Thiophenyl)-carbazole", CHINESE CHEMICAL LETTERS, vol. 12, no. 12, 2001, pages 1141-1144, XP002694337, * page 1141, lines 5-6,12-15,20-21; figure Scheme 1 * * page 1142, lines 10-26 * * page 1144, lines 4-6 * -----	1-6	
			TECHNICAL FIELDS SEARCHED (IPC)
			H01L C07D C07F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 March 2013	Examiner Fratiloiu, Silvia
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

1
EPO FORM 1503 03/82 (P04001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 17 6592

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

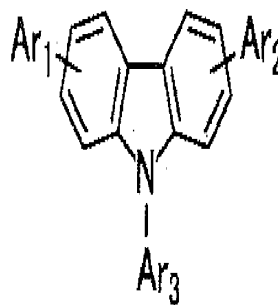
22-03-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2184333 A2	12-05-2010	EP 2184333 A2	12-05-2010
		JP 2010114079 A	20-05-2010
		KR 20100050271 A	13-05-2010
		US 2010108984 A1	06-05-2010

专利名称(译)	发光装置和显示单元		
公开(公告)号	EP2416392A3	公开(公告)日	2013-05-01
申请号	EP2011176592	申请日	2011-08-04
[标]申请(专利权)人(译)	株式会社理光		
申请(专利权)人(译)	RICOH COMPANY, LTD.		
当前申请(专利权)人(译)	RICOH COMPANY, LTD.		
[标]发明人	HARADA SHIGEYUKI SASAKI MASAOMI ABE MIKIKO		
发明人	HARADA, SHIGEYUKI SASAKI, MASAOMI ABE, MIKIKO		
IPC分类号	H01L51/00 H01L51/50		
CPC分类号	H01L51/0072 H01L51/0035 H01L51/0037 H01L51/0068 H01L51/0094 H01L51/502 H01L2251/308 H05B33/14		
优先权	2010178148 2010-08-06 JP 2011154838 2011-07-13 JP		
其他公开文献	EP2416392A2 EP2416392B1		
外部链接	Espacenet		

摘要(译)

一种发光器件，具有基板和设置在基板上的发光层，其包括与咪唑衍生物配位键合或连接的半导体纳米晶体，具有由化学结构1表示的化合物的芳环的咪唑衍生物具有三个取代基：其中Ar1和Ar2独立地代表取代或未取代的芳基，它们可以共有连接以形成具有苯环，杂环基和氢原子的环，Ar3代表取代或未取代的芳基，由化学结构2表示的一至三个取代基：-XYZ化学结构2其中X代表亚甲基，羰氧基，氧羰基，羰基，氧原子和硫原子，Y代表取代的或未取代的亚烷基，Z表示羧基，羟基和硫醇基。



Chemical Structure 1